



**DEPARTMENT OF THE ARMY**  
CHIEF OF ENGINEERS  
2600 ARMY PENTAGON  
WASHINGTON, DC 20310-2600

DAEN

16 APR 2014

SUBJECT: Lake Worth Inlet, Palm Beach Harbor, Navigation Improvements Project, Palm Beach County, Florida

THE SECRETARY OF THE ARMY

1. I submit for transmission to Congress my report on navigation improvements for Lake Worth Inlet, Palm Beach Harbor, Palm Beach County, Florida. It is accompanied by the reports of the district and division engineers. These reports were prepared as an interim response to a resolution by the House Committee on Transportation and Infrastructure dated 25 June 1998 which requested the Secretary of the Army to review the report of the Chief of Engineers on the Palm Beach Harbor, Florida, published as House Document 283, 86<sup>th</sup> Congress, 1<sup>st</sup> Session, and other pertinent reports, with a view of determining if the authorized project should be modified in any way at this time, with particular reference to widening the existing interior channel through Lake Worth Inlet. Preconstruction engineering and design (PED) activities for the Lake Worth Inlet, Palm Beach Harbor, Palm Beach County, Florida Navigation Project will continue under the authority cited above.

2. The reporting officers recommend authorization of a project that will contribute significantly to the economic efficiency and increased safety of commercial navigation in Palm Beach Harbor. The harbor entrance (also known as Lake Worth Inlet) is an artificial cut through the barrier island and limestone formation connecting Palm Beach Harbor to the Atlantic Ocean. The closest major ports to the Port of Palm Beach are Port Everglades, in Ft. Lauderdale, and Miami Harbor, approximately 40 miles and 65 miles to the south, respectively. Palm Beach Harbor is the 4<sup>th</sup> busiest container port in Florida and the eighteenth busiest in the continental United States. The port is a major center for the shipment of bulk sugar, molasses, cement, utility fuels, produce, break bulk and specialized items, and container shipments to the Caribbean. Lake Worth Inlet, serving as the entrance channel to the port, is inadequate both in width and depth, negatively impacting future port potential and creating economic inefficiencies with the current fleet of vessels. Based on existing fleet sizes, the port is operating with insufficient channel width and depth. As a result of these deficiencies, the local harbor pilots in conjunction with the U.S. Coast Guard have placed restrictions on vessel transit to ensure safety, resulting in economic inefficiencies and increased costs to the nation. The Port of Palm Beach is the non-federal cost-sharing sponsor.

3. The reporting officers identified a plan for improvements to the existing Lake Worth Inlet federal navigation project which will contribute significantly to the economic efficiency of commercial navigation in the region. The recommended plan is the National Economic

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Development (NED) Plan and is supported by the non-federal sponsor. The recommended plan includes channel deepening, widening, improvements to the main turning basin, and an advanced maintenance plan to reduce the costs of future operations and maintenance:

a. Main Channels Improvement Plan: The project would deepen the inner channel from the -33 feet mean lower low water (MLLW) to a project depth of -39 feet MLLW and the entrance channel from -35 feet MLLW to -41 feet MLLW. The channel widening footprint includes the addition of a new channel flare on the south side of the outer portion of the entrance channel, widening of the entrance channel from 400 feet to between 440-460 feet, and widening the inner channel from 300-450 feet.

b. Turning Basins: The Main Turning Basin would be deepened from -33 feet MLLW to -39 feet MLLW and extend the southern boundary of the turning basin an additional 150 feet south. The project would also remove a notch south of Peanut Island on the north side of the turning basin. No additional navigational improvements are being recommended for the smaller North Turning Basin with depths remaining at -25 feet MLLW.

c. Advanced Maintenance Plan: Several settling basins critical to the advanced maintenance plan would be dredged to depths ranging from -26 feet MLLW to -51 feet MLLW just north of the entrance channel to catch sediment before it enters the entrance channel. A 1,700 linear foot section of the entrance channel would be deepened for advanced maintenance to depths of -51 feet MLLW in the more easterly half of the entrance channel and -44 feet MLLW in the westerly section. Due to the additional deepening of the entrance channel for advanced maintenance, the project also includes the cost of stabilizing the north jetty with a 600 linear-feet sheet pile wall installed along the oceanward length of the jetty to a depth of -60 feet MLLW. The advance maintenance plan will reduce the frequency of operation and maintenance (O&M) dredging to once every two years (currently once per year), resulting in an annual savings of \$850,000 to the O&M program.

4. The project would require the removal of approximately 1.4 million cubic yards of rock that will be placed at the designated Palm Beach Ocean Dredged Material Disposal Site (ODMDS) located about 5 miles east of the project. The U.S. Army Corps of Engineers (Corps), in coordination with the U.S. Environmental Protection Agency, will complete a study during PED to increase the allowable disposal limit per dredging event in the ODMDS over and above the current limit of 500,000 cubic yards per dredging event. It is the policy of the Corps to beneficially use dredged material where practical. Approximately 450,000 cubic yards of sand dredged from the channels will be placed in the near shore zone below the mean high water line out to the -17 feet MLLW contour along an approximate 3,000 feet reach of coast south of the inlet.

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5. Impacts caused by the navigational improvements include the losses of 4.5 acres of seagrass habitat and 4.9 acres of low relief hardbottom habitat, for which mitigation will be required. To mitigate for the impacts to seagrasses the project includes a mitigation plan that proposes filling existing borrow areas in Lake Worth Lagoon with approximately 125,000 cubic yards of dredged material to an elevation consistent with adjacent seagrass beds. Subsequent colonization of the restored substrate is anticipated by natural recruitment. The mitigation plan for the loss of hardbottom habitat is the creation of artificial reefs using limestone excavated from the entrance channel or quarried native limestone. The artificial reef construction would use about 25,100 cubic yards of rock to create mounds approximately 20 feet by 40 feet in size with a vertical relief of 3 to 4 feet. The exact locations of the mitigation sites and actual mitigation amounts will be determined after a more detailed resource survey and functional assessment conducted during PED. The current estimate of 11.25 acres of mitigation for both seagrasses and hardbottom is recommended based on the evaluation of comparable mitigation efforts from similar projects in the region. Monitoring of seagrass mitigation sites will be conducted on a monthly basis for the first year, then twice a year for years two and three, and once a year for years four and five. The monitoring program for the mitigation of hardbottoms will consist of physical monitoring to assess the degree of settling of the hardbottom materials after the first year, and biological monitoring to compare populations of algae, invertebrates and fish with natural hardbottom areas.

6. Project costs are allocated to the commercial navigation purpose and are based on October 2013 prices.

a. Project First Cost. The estimated project first cost is \$88,531,000, which includes the cost of constructing the general navigation features (GNFs) and the lands, easements, rights-of-way, and relocations (LERR) estimated as follows: \$87,209,000 for channel modifications and advanced maintenance settling basins, turbidity and endangered species monitoring, environmental mitigation, and dredged material placement; \$1,290,000 for post construction mitigation monitoring; and \$32,000 for real estate administrative costs.

b. Estimated Federal and Non-federal Shares. The estimated federal and non-federal shares of the project first cost are \$57,556,000 and \$30,975,000 respectively, as apportioned in accordance with the cost sharing provisions of Section 101 of Water Resources Development Act (WRDA) 1986, as amended (33 U.S.C. 2211), as follows:

(1) The cost for the GNFs from greater than 20 feet to 45 feet will be shared at a rate of 75 percent by the government and 25 percent by the non-federal sponsor, plus;

(2) In addition to the costs outlined in sub-paragraph (1) above, the project first cost includes federal administrative costs for lands, easements, rights of way and relocations

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estimated at \$32,000. The federal portion of these costs is \$19,000. The non-federal portion is \$13,000, all of which is eligible for LERR credit.

c. Additional 10 Percent Payment. In addition to the non-federal sponsor's estimated share of the total first cost of constructing the project in the amount of \$21,125,000 pursuant to Section 101(a)(2) of WRDA 1986, as amended, the non-federal sponsor must pay an additional 10% of the costs of GNFs of the project, \$8,849,900, in cash over a period not to exceed 30 years, with interest. The value of the LERR provided by the federal sponsor under Section 101(a)(3) of WRDA 1986 as amended will be credited toward this payment.

d. Operations and Maintenance Costs. The project results in a minor increase in the annual federal maintenance dredging from 117,500 to 120,000 cubic yards. However, the advanced maintenance plan will result in an average annual equivalent savings to the operation and maintenance program in the amount of \$850,000 in comparison to the annual operations and maintenance costs of about \$3,794,000 for the existing project.

e. Associated Costs. Estimated associated costs include \$25,000 for aids to navigation (a U.S. Coast Guard expense).

f. Authorized Project Cost and Section 902 Calculation. The project first cost, for the purposes of authorization and calculating the maximum cost of the project pursuant to Section 902 of WRDA 1986, as amended, should include estimates for general navigation features (GNF) construction costs, the value of lands, easements, and rights-of-way and the value of relocations provided under Section 101(a)(3) of WRDA 1986, as amended. Accordingly, as set forth in paragraph 4.a. above, based on Price Level Fiscal Year (FY) 2014, the estimated project first cost for these purposes are \$88,531,000. Based on FY 2014 price levels, a 3.5-percent discount rate, and a 50-year period of analysis, the total equivalent average annual costs of the project are estimated to be \$3,960,000. The equivalent average annual benefits are estimated to be \$7,940,000. The average annual net benefits are \$3,980,000. The benefit-to-cost ratio for the recommended plan is 2.0.

7. The recommended plan was developed in coordination and consultation with various federal, state and local agencies using a systematic and regional approach to formulating solutions and evaluating the benefits and impacts. Risk and uncertainty were evaluated for economic benefits, costs and sea level rise. Economic sensitivities examined the effects of various commodity forecasts which included no growth, lower growth rates or capping the growth earlier in the period of analysis. These sensitivities showed that even with significantly reduced commodity throughput, the project would still be justified. In addition a cost and schedule risk analysis was completed. In accordance with the Corps Engineering Circular on sea level change the study analyzed three sea level rise rates. Historic (baseline), mid-level, and maximum rates were

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estimated to be 0.39 feet, 0.89 feet, and 2.47 feet, respectively, over the 50-year project life. The study concluded that no impact would result from sea level rise with respect to dredging and channel use, and that the terminal facilities would continue to operate under all conditions.

8. In accordance with the Corps Engineering Circular on review of decision documents, all technical, engineering and scientific work underwent an open, dynamic and vigorous review process to ensure technical quality. This included District Quality Control (DQC), Agency Technical Review (ATR), Policy and Legal Compliance Review, Cost Engineering Center of Expertise Review and Certification, Model Review and Approval, and Independent External Peer Review (IEPR). All concerns of the ATR have been addressed and incorporated into the final report. The IEPR was completed by Battelle Memorial Institute in July 2013 and a revised Comment Response Record was issued by the IEPR panel on 10 January 2014 indicating that all comments were satisfactorily addressed. The panel had seven comments, two of which they considered significant, two were medium significance and three were low significance. The most significant finding by the panel related to the commodity forecast and vessel costing documentation. While the 2017-2067 commodity growth forecast appeared reasonable, the assumed growth between 2013 and 2017 was not adequately supported by the report documentation which raised questions about the reliability of the benefit estimates. The panel also commented that documentation on vessel operations and costing was insufficient. Other comments raised by the panel included capacity of the ODMDS, long-term management of dredged material, role of the existing sand bypassing north of the project, air quality, and shoaling rates. In summary, the panel felt that the engineering, economics and environmental analysis were adequate and the additional sensitivity analysis and clarifications needed to be properly documented in the final report. The final report was revised accordingly.

9. The plan recommended by the reporting officers is technically sound, environmentally and socially acceptable, and economically justified. The views of interested parties, including federal, state and local agencies have been considered. The U.S. Coast Guard requested information on the relocation of the aids to navigation, including the cost and schedule which were not fully described in the final report. The requested information has been provided to the Coast Guard. The USEPA submitted a number of comments during State and Agency review concerning seagrass mitigation, potential for effects to groundwater resources, air quality analysis, induced storm surge increases, railroad alternatives to harbor deepening and purpose and need for harbor deepening. The Corps has determined that the existing report adequately addresses effects to groundwater resources, railroad alternatives to harbor deepening, and purpose and need for the recommended improvements. In regards to possible storm surge increases, the Corps does not anticipate any negative flooding effects to be caused by the project due to the insignificant amount of possible increase (0-4 inches), infrequency of the flooding event (1% flood) that could lead to an increase, and much greater effects anticipated due to sea

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level rise. The following actions will be implemented as part of this project to address USEPA concerns:

a. Seagrass Mitigation. The Corps will conduct a survey prior to construction to confirm the extent of seagrasses at the site. The Corps will also continue to coordinate with Palm Beach County Department of Environmental Resources concerning siting of the seagrass mitigation areas. Lastly, the dredged material that would be used in the seagrass mitigation areas would be tested for contaminants prior to use.

b. Air Quality Analysis. The Corps has developed an errata sheet for the final feasibility report and EIS that clarifies that the air pollutants of concern are expressed in units of tons/year.

10. I concur in the findings, conclusions, and recommendations of the reporting officers. Accordingly, I recommend that navigation improvements for Lake Worth Inlet be authorized in accordance with the reporting officers' recommended plan at an estimated cost of \$88,531,000 with such modifications as in the discretion of the Chief of Engineers may be advisable. My recommendation is subject to cost sharing, financing, and other applicable requirements of federal and state laws and policies, including Section 101 of WRDA 1986, as amended. This recommendation is subject to the non-federal sponsor agreeing to comply with all applicable federal laws and policies including that the non-federal sponsor must agree with the following requirements prior to project implementation.

a. Provide, during the periods of design and construction, funds necessary to make its total contribution for commercial navigation equal to 25 percent of the cost of design and construction of the GNFs attributable to dredging to a depth in excess of -20 feet MLLW but not in excess of -45 feet MLLW.

b. Provide all lands, easement, and rights-of-way (LER), including those necessary for the borrowing of material and placement of dredged or excavated material, and perform or assure performance of all relocations, including utility relocations, all as determined by the government to be necessary for the construction or operation and maintenance of the GNFs.

c. Pay with interest, over a period not to exceed 30 years following completion of the period of construction of the GNFs, an additional amount equal to 10 percent of the total cost of construction of GNFs less the amount of credit afforded by the government for the value of the LER and relocations, including utility relocations, provided by the non-federal sponsor for the GNFs. If the amount of credit afforded by the government for the value of LER, and relocations, including utility relocations, provided by the non-federal sponsor equals or exceeds 10 percent of the total cost of construction of the GNFs, the non-federal sponsor shall not be required to make any contribution under this paragraph, nor shall it be entitled to any refund for the value of LER

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and relocations, including utility relocations, in excess of 10 percent of the total costs of construction of the GNFs.

d. Provide, operate, and maintain, at no cost to the government, the local service facilities in a manner compatible with the project's authorized purposes and in accordance with applicable federal and state laws and regulations and any specific directions prescribed by the government.

e. In the case of project features greater than -45 feet MLLW in depth, provide 50 percent of the excess cost of operation and maintenance of the project over that cost which the government determines would be incurred for O&M if the project had a depth of -45 feet MLLW.

f. Give the government a right to enter, at reasonable times and in a reasonable manner, upon property that the non-federal sponsor owns or controls for access to the project for the purpose of completing, inspecting, operating and maintaining the GNFs.

g. Hold and save the United States free from all damages arising from the construction or operation and maintenance of the project, any betterments, and the local service facilities, except for damages due to the fault or negligence of the United States or its contractors.

h. Perform, or ensure performance of, any investigations for hazardous substances that are determined necessary to identify the existence and extent of any hazardous substances regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 USC 9601–9675 that may exist in, on, or under LER that the federal government determines to be necessary for the construction or operation and maintenance of the GNFs. However, for lands, easements, or rights-of-way that the federal government determines to be subject to the navigation servitude, only the federal government shall perform such investigation unless the federal government provides the non-federal sponsor with prior specific written direction, in which case the non-federal sponsor shall perform such investigations in accordance with such written direction.

i. Assume complete financial responsibility, as between the federal government and the non-federal sponsor, for all necessary cleanup and response costs of any hazardous substances regulated under CERCLA that are located in, on, or under LER that the federal government determines to be necessary for the construction or operation and maintenance of the project.

j. To the maximum extent practicable, perform its obligations in a manner that will not cause liability to arise under CERCLA.

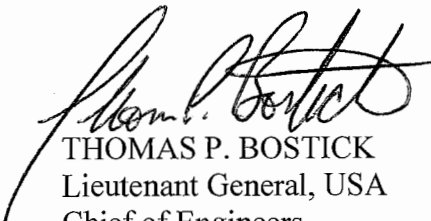
k. Accomplish all removals determined necessary by the federal government other than those removals specifically assigned to the federal government.

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1. Mitigation monitoring during construction and post construction shall be cost shared between the federal government and non-federal sponsor, 75 percent and 25 percent, respectively.

11. The recommendation contained herein reflects the information available at this time and current departmental policies governing formulation of individual projects. It does not reflect program and budgeting priorities inherent in the formulation of a national civil works construction program or the perspective of higher review levels within the executive branch. Consequently, the recommendation may be modified before it is transmitted to the Congress as a proposal for authorization and implementation funding. However, prior to transmittal to the Congress, the State of Florida, the Port of Palm Beach (the non-Federal sponsor), interested federal agencies, and other parties will be advised of any significant modifications and will be afforded an opportunity to comment further.



THOMAS P. BOSTICK  
Lieutenant General, USA  
Chief of Engineers